

*On the Developmental History and Reproductive Power of the Orthoptera.* By VITUS GRÜBER.

In this memoir the Orthoptera are first of all divided into two groups, in accordance with the different development of the wings in their various stages: the insects belonging to the first section (*Forficulinæ*, *Blattinæ*, *Mantidæ*, and *Phasmidæ*) show in all their stages more or less developed rudiments of wings horizontally amalgamated with the mesonotum and metanotum (horizontal-fixed-wing development); those of the second group (including the *Gryllidæ*, *Locustidæ*, and *Acridiidæ*), which are subjected to a more detailed examination, in their first stages are either destitute of wing-rudiments or have them united only vertically with the sides of the meso- and metanotum (*Stadium lobulare* i., ii., &c.), and in their last phases of development possess distinct, free wing-sheaths placed upon the back (*Stadium vaginale* i., ii., or *ultimum*, &c.).

In the *Gryllidæ* the first three stages (usually) present vertical-attached wing-rudiments, the last two horizontal free wing-sheaths.

The *Locustidæ* characterized by complete development of the wings present a similar condition, whilst in the *Acridiidæ* there occur (probably) only two stages, with merely lobular lateral wing-rudiments; and the last two stages correspond with those of the *Gryllidæ* and *Locustidæ*.

The wing-sheaths in the last stage but one (*vaginale* i.) are more separated from each other, reach in (most) *Gryllidæ* only a little beyond the metanotum, in the *Acridiidæ* scarcely beyond the first, and in the *Locustidæ* not beyond the third dorsal plate, and never show distinct transverse veins; whilst in the last stage (*vaginale* ii.) they accurately represent on a small scale the venation of the perfectly developed wings, and close together by their inner margins over the middle line of the back like a roof, the elytra being for the most part concealed by the wing-sheaths.

In those forms which, when fully developed, never possess wings, and sometimes have only rudimentary elytra, the rudiments of the flying-apparatus are proportionally smaller in the last stage and the last but one; but in all cases distinct wing-sheaths are to be detected besides the elytra (*Platyphyma*, *Pezotettix*, *Chrysochroon* ♀, *Thamnotrizon*, &c.).

Lastly, the author calls attention to the sexual differences of the *Locustidæ* and *Acridiidæ* in their first stage, this being distinctly expressed in the form of the last ventral (genital) plate. In the male this is simple and more or less oval; in the female, on the contrary, composed either of four (*Acridiidæ*) or six (*Locustidæ*) lamellæ. From the comparison and dissection of the external sexual apparatus of the female in the succeeding stages, it appears that the ovipositor of a female Locustide is composed of six laminæ (or more properly three pairs of laminæ), three of which unite to form a lateral half. The previously quite unknown median lamellæ are very narrow, and setiform, and apply themselves very closely to the inferior laminæ.

In the second part of his memoir the author records one or two experiments upon the reproductive power of the Orthoptera, from which it appears that antennæ which were almost entirely cut away in the first stages of development certainly again acquired their normal length during the succeeding moults, but assumed a peculiar geniculate form; and that a piece cut out of the side of a wing-sheath, (in the last stage but one, for example) was almost entirely replaced at the next moult, although the wing thus treated was finally smaller, and especially shorter, than the corresponding uninjured one.—*Bericht der Akad. der Wiss. in Wien*, 3rd January, 1866, pp. 6-8.

*On two Hydrozoa of the Mediterranean.*

By Prof. DE FILIPPI.

In the marine aquaria of the Zoological Museum of Turin, M. de Filippi has met with two Hydrozoa, one of which appears to be new, and the author proposes for it the name of *Halybothys*; the other belongs to the genus *Eleutheria* of Quatrefages. The latter genus, which has been carefully investigated of late years by different observers, has not always furnished the same results; and this, according to M. de Filippi, arises from the observations having been made upon different species. Of these, he distinguishes at least three: (1) the original species of M. de Quatrefages, (2) that of M. Claparède, and (3) that of M. Krohn and Mr. Hincks. To the latter the individuals observed at Turin appear to belong. The first is characterized by a terminal knob of nematocysts at the extremity of each of the two branches of its six arms; the second by the normal existence of eight arms and four gastrovascular canals. M. Claparède, indeed, observed some *Eleutheria* having eight arms and six gastrovascular canals, and others with six arms and six canals. M. de Filippi thinks that these anomalies may be explained by a confusion of two species radiated in accordance with different numbers. Finally, the last species, which was observed by the author to the number of several thousands, possesses, like the second, knobs of nematocysts only at one of the extremities of its bifurcate arms; and the number of radiating gastrovascular canals is normally six. Nevertheless fifteen per cent. of the individuals observed presented seven arms and six gastrovascular canals—a variation not very well fitted to confirm the hypothesis that M. Claparède had two species before him.

Whatever may be thought of these specific differences, it is certain that the *Eleutheria* present great differences in their mode of reproduction. Whilst the *Eleutheria* of Normandy observed by M. Claparède always bore their germs in the cavity of the subumbrella, M. de Filippi, like M. Krohn, has seen those of the Mediterranean constantly bearing buds on the outer surface of the umbrella, and these buds themselves frequently producing new buds before detaching themselves from their parent. In this case we find three generations attached to each other, the oldest of which may at the same time contain ova.